WE CLAIM:

1. A method for inhibiting differentiation of mammalian stem cells, comprising (a) providing a population of stem cells, (b) introducing a vector comprising an HSC differentiation-inhibiting polynucleotide sequence shown in Table 1 and Table 4 into the stem cells, and (c) expressing a polypeptide encoded by the polynucleotide by culturing the modified stem cells, thereby inhibiting differentiation of the stem cells.

2. The method of claim 1, wherein the population of stem cells are isolated from bone marrow.

3. The method of claim 1, wherein the stem cells are human hematopoietic stem cells.

4. The method of claim 3, wherein the stem cells are first selected for expression of CD34 and Thy prior to introducing the vector.

5. The method of claim 1, wherein the stem cells are mouse hematopoietic stem cells.

6. The method of claim 5, wherein the stem cells are first selected for expression of CD38 and lack of expression of CD34 prior to introducting the vector.

7. The method of claim 1, wherein the HSC differentiation-inhibiting polynucleotide encodes GATA-binding protein 3 (Gata3) or ID3.

8. A method for increasing the effective dose of hematopoietic stem cells in a mammalian subject, comprising (a) providing a population of hematopoietic stem cells, (b) introducing into the cells an HSC differentiation-inhibiting polynucleotide selected from Table 1 and Table 4, and (c) administering the genetically modified cells that express an HSC differentiation-inhibiting polypeptide to a mammalian subject; thereby increasing the effective dose of hematopoietic stem cells in the subject.

9. The method of claim 8, wherein the administered stem cells are a subpopulation of the modified cells that are selected for expression of the polypeptide prior to administering to the subject.

10. The method of claim 8, wherein the administered stem cells overexpress the HSC differentiation-inhibiting polypeptide.

11. The method of claim 8, wherein the hematopoietic stem cells are obtained from bone marrow.

12. The method of claim 8, wherein the subject is human, and the hematopoietic stem cells are human hematopoietic stem cells.

13. The method of claim 12, wherein the hematopoietic stem cells are selected for expression of CD38 and Thy prior to introduction of the HSC differentiation-inhibiting polynucleotide.

14. The method of claim 8, wherein an expression vector comprising the HSC differentiation-inhibiting polynucleotide is introduced into the cells.

15. A method for inhibiting hematopoietic stem cell differentiation, comprising contacting a population of HSCs with an effective amount of an HSC differentiation-inhibiting polypeptide selected from Tables 1 and 4, thereby inhibiting differentiation of the HSCs.

16. The method of claim 15, wherein the HSCs are present in an in vitro cell culture.

17. The method of claim 15, wherein the HSCs are present in a subject grafted with the HSCs.

18. The method of claim 15, wherein the subject is human, and the HSC differentiation-inhibiting polypeptide is selected from the group shown in Table 2.

19. A method for isolating a population of cells that are enriched for hematopoietic stem cells (HSCs), the method comprising (a) obtaining a sample of cells containing hematopoietic stem cells, (b) selecting cells from the sample based on expression or lack of expression of at least one known HSC surface marker, and at least one molecule shown in Table 2 and Table 7 and (c) separating cells with the known HSC marker and at least one of the molecules shown in Table 2 and Table 7 thereby isolating a population of human cells enriched for hematopoietic stem cells.

20. The method of claim 19, wherein the hematopoietic stem cells are human HSCs.

21. The method of claim 20, wherein the known HSC marker is $CD34^+$ and Thy^+.

22. The method of claim 20, wherein the at least one molecule is a surface molecule shown in Table 2.

23. The method of claim 19, wherein the hematopoietic stem cells are mouse HSCs.

24. The method of claim 23, wherein the known HSC marker is $CD38^+$ and $CD34^-$.

25. The method of claim 23, wherein the isolated population of cells are also selected for expression of c-kit and Sca-1 but lack of expression of Lin.

26. The method of claim 19, wherein the sample of cells are obtained from bone marrow.

27. A method of enumerating hematopoietic stem cells in a population of cells, comprising (a) contacting the population of cells with an antibody that specifically binds to one HSC surface marker shown in Table 2 and Table 7 under conditions which allow the antibody to specifically bind to the HSC surface marker; and (b) quantifying the

cells recognized by the antibody; thereby enumerating hematopoietic stem cells in the population of cells.

28. The method of claim 27, wherein the population of cells is a mixture of hematopoietic cells.

29. The method of claim 27, wherein hematopoietic stem cells are human HSCs, and the population of cells are first selected for expression of CD34 and Thy prior to the contacting.

30. The method of claim 27, wherein hematopoietic stem cells are mouse HSCs, and the population of cells are first selected for expression of CD38 but lack of expression of CD34 prior to the contacting.